



ATTACHMENT J-10

Sample Task Order (STO) #2 – ENVIRONMENTAL DATA NETWORK

1.0 Introduction

The Environmental Assessment Agency (EAA) recently signed Memorandum of Agreements (MOAs) with several South American countries for the purpose of collecting environmental and weather data from remote outposts to better support environmental trend analysis. The EAA requires a satellite-based communication network to backhaul data from remote sensor outposts that are installed in each country.

2.0 Objective

The Contractor shall design, deploy, and sustain a satellite-based network to support data collection from sensors in remote locations within South America. The EAA will provide security for all equipment installed at each of the remote sites (e.g., fencing and motion-activated surveillance cameras). Each of the sites has a 20 x 20 feet concrete pad enclosed by 6 foot high security fencing. The Contractor will select the best technology and band for this solution.

The suites of sensors and motion-activated surveillance cameras currently installed by the EAA at each remote site will share power with the satellite terminal. The Contractor will need to provide solar power (to include battery back-up) for all equipment installed by the Contractor at four of the six remote sites including the remote sensors power over Ethernet (PoE). The daily duty cycle for the terminal transmitting will be approximately 5 min per day to transmit captured environmental and weather data. Each sensor and terminal will be programmed to communicate at different times at each location. This will minimize total system bandwidth needed and also take advantage of saving battery power for solar operation.

The estimated data transferred per day will be approximately 5 Megabytes (MB) per site. This 5 MB figure would include occasional agency personal use, sensor data collected, and possible motion-activated surveillance camera activity. The network must also provide a capability to share the remote sensor bandwidth and motion-activated surveillance camera bandwidth with occasional personnel operational needs. The remote sites are typically unmanned, but there will be short periods where EAA will send staff to sites to perform additional data collection or local maintenance for the sensors. The estimated usage profile for these agency personnel is not expected to exceed 3 hours per day, 5 days per year for each site. No additional bandwidth is required for personnel usage.



3.0 Summary of Requirements

The Contractor shall propose a solution compliant with all sample task order requirements that delivers the required quality of service and availability and articulates rationale for the choice of architecture and components, including life cycle cost considerations.

Services and equipment to be provided include:

- Central satellite gateway(s) - Contractor defined location(s) with connection to the Internet
- Satellite connectivity to the remote sensor site
- Solar Power (to include battery back-up) for all equipment installed by the Contractor at four of the sites (there is AC (110 or 220 VAC) power installed at two of the sites: Puerto Williams, Chile and Ventiocho de Novembre, Argentina).
- Three (3) Category 5e Ethernet connections to the satellite terminal (Sensor, Remote User, and motion-activated surveillance camera)
- The Contractor terminal system is required to provide PoE +5V / 250 mA or PoE IEEE 802.3af for the Government Furnished Equipment (GFE) sensor system and motion-activated surveillance camera installed at each location.
- Static private IP addresses for each site accessible through a Virtual Private Network (VPN).
- System Design
- System Documentation
- Managed Network Services
- Engineering Planning
- Installation and Sustainment Planning
 - Installation
 - Integration & Testing
 - Integrated Logistics Support
 - Operations & Maintenance

3.1 Management Requirements

3.1.1 The Contractor shall provide a detailed project schedule (e.g., Microsoft Project or equivalent) in PDF format for the entire Task Order lifecycle.

3.1.2 The Contractor shall discuss:

- 3.1.2.1 The roles and responsibilities of the Contractor and Subcontractors that will contribute to the solution, how work will be partitioned among subcontractors (if applicable), and how subcontractors will be managed.



- 3.1.2.2 Identification and assessment of the Personnel Travel, Environmental, and Safety Hazards for each remote site.
- 3.1.2.3 Establishment of U.S. Government access to a web portal to present the health of the entire solution in a consolidated view.
- 3.1.2.4 Program management approach, procedures, and performance metrics and provide an explanation of how they will be used to ensure timely system development, installation and operation.
- 3.1.2.5 Process and procedures they will employ for coordination with external offices and agencies, EAA Operations Centers, and other communications planners, managers and operators.
- 3.1.2.6 Identification and assessment of risks and a mitigation strategy that minimizes cost, schedule, and performance risk.
- 3.1.2.7 Process and procedures they will employ to develop and furnish the deliverables in Section 7.2.
- 3.1.2.8 Identification of all equipment, on a per-country basis, that are on either the International Traffic in Arms Regulations (ITAR) or Department of Commerce export control lists and provides a plan to manage the equipment in compliance with all applicable regulations.

3.2 Technical Requirements

3.2.1 System Engineering

- 3.2.1.1 The Contractor shall develop and document a solution compliant with all sample task order requirements that delivers the required quality of service and availability and articulates rationale for the choice of architecture and components, including life cycle cost considerations. The Contractor shall discuss how lessons learned from previous projects were incorporated. The Contractor shall provide a high-level network architecture diagram showing nodes and gateway locations. The Contractor shall provide coverage maps for Fixed Satellite Service (FSS) or Mobile Satellite Service (MSS) based solutions; additionally, link budgets for each remote location are required for FSS based solutions. The Contractor shall define and provide the enclosure or shelter power and network interface connections that will withstand environmental rigors at each site.



- 3.2.1.2 The Contractor shall clearly explain their recommendation for bandwidth, stating assumptions, to ensure that only the necessary amount of bandwidth is leased. The Contractor shall implement configuration management, prepare engineering documents and reference manuals, and provide engineering and testing services for the Environmental Data Network.
- 3.2.1.3 The Contractor shall identify valid installation challenges and risks (excluding any items provided as (GFE), and provide realistic mitigation for each.
- 3.2.1.4 The Contractor shall discuss how their system incorporates reliability, availability, maintainability, security, network monitoring and interoperability.
- 3.2.1.5 The Contractor shall address system flexibility and optimization, accommodating potential future needs to support either new sites or higher per-site data transfer needs or spectral optimization to minimize bandwidth needs.
- 3.2.1.6 The Contractor shall address the power requirements for the following sites: Potosi, Bolivia; Manaus, Brazil; Ciudad Bolivar, Venezuela; La Rinconada, Peru. The Contractor shall provide a solar power source for each of the four sites that include battery back-up. The solar power source shall provide power to all Contractor provided equipment and provide PoE +5V / 250 mA or PoE IEEE 802.3af for the Government Furnished Equipment (GFE) sensor system and motion-activated surveillance camera installed at each location.
- 3.2.1.7 The Contractor shall include battery back-up for the two locations that have commercial AC power (Puerto Williams, Chile and Ventiocho de Noviembre, Argentina) and do not require any solar power.

3.2.2 Satellite Communications Terminals



- 3.2.2.1 The Contractor shall procure, integrate, and deploy environmentally protected enclosure (cabinet or shelter) to each remote site that will house any satellite communications terminal and ancillary equipment that requires environmental protection. Each enclosure shall be designed to withstand the environmental rigors specific to each site with a minimum rating of the exposed components at Ingress Protection (IP) 65 or equivalent. The enclosure is only required to be large enough to support the satellite communications terminal and ancillary equipment requiring environmental protection provided by the Contractor. Sizing will be Contractor defined based on the solution or equipment selected.
- 3.2.2.2 The Contractor shall ensure that all components are interoperable. The Contractor shall connect the GFE sensor and GFE motion-activated surveillance cameras Ethernet connections to their equipment and verify operation at each site. These Ethernet connections will be located within the enclosure or shelter and should not have access from the outside environment.
- 3.2.2.3 The Contractor shall explain how the solution proposed meets the Government’s Committed Information Rate (CIR) requirements. The remote Satellite Terminal locations and the summary of data transport requirements, to include bandwidth sharing for occasional personnel operational needs, are provided for each site in Table 1 below.
- 3.2.2.4 The Contractor shall provide Original Equipment Manufacturer (OEM) Terminal/Equipment Technical Specifications (e.g. datasheets) for all proposed terminal equipment.

Table 1. Summary of Data Transport Requirements

Remote Site ID	Remote Site Locations	Committed Information Rate (CIR) Requirements
Site 1	Puerto Williams, Chile	IP-based transport to backhaul data from sensors to the central collection point (440 kbps inbound, 440 kbps outbound)
Site 2	Ventiocho de Novembre, Argentina	IP-based transport to backhaul data from sensors to the central collection point (440 kbps inbound, 440 kbps outbound)
Site 3	Potosi, Bolivia	IP-based transport to backhaul data from sensors to the central collection point (440 kbps inbound, 440 kbps outbound)
Site 4	Manaus, Brazil	IP-based transport to backhaul data from sensors to the central collection point (440 kbps inbound, 440 kbps outbound)



Site 5	Ciudad Bolivar, Venezuela	IP-based transport to backhaul data from sensors to the central collection point (440 kbps inbound, 440 kbps outbound)
Site 6	La Rinconada, Peru	IP-based transport to backhaul data from sensors to the central collection point (440 kbps inbound, 440 kbps outbound)
All Sites		The network must also provide a capability to share the remote sensor bandwidth with occasional personnel operational needs. Agency personnel will arrive to the sites with a laptop and require internet service connectivity throughput up to 440 kbps outbound and up to 440 kbps inbound. The CIR rate will not increase when agency personnel travel to the remote sites.
Inbound - Data transmitted by the satellite terminal to the Gateway		
Outbound - Data transmitted by the Gateway to the satellite terminal		
Note: The network CIR is 440 kbps inbound, 440 kbps outbound		

3.2.3 Managed Network Services

- 3.2.3.1 The Contractor shall provide turnkey satellite transmission capability that includes all necessary software, hardware, service, and maintenance support to all locations. The Contractor shall be fully responsible for assuring operational availability of the system.
- 3.2.3.2 The managed network services shall include space segment, teleport, and terrestrial components as necessary to ensure a complete end-to-end communications solution between the sensor systems and the Internet. All equipment delivered as part of the complex satellite solution shall be new equipment.
- 3.2.3.3 Central satellite gateway(s) - Contractor defined location(s) with connection to the Internet. Provide all internet access through a U.S. based internet Point of Presence.
- 3.2.3.4 Space segment coverage shall include all sites in South America. FSS solutions require the Contractor to provide maps with clearly depicted and labeled contour lines, demonstrating coverage across the required locations. Contour lines should clearly demonstrate satellite gain to noise temperature ratio (G/T), effective isotropic radiated power (EIRP).
- 3.2.3.5 The Contractor shall meet or exceed a 99.5% link availability for all required satellite links to and from each remote site.



- 3.2.3.6 The Contractor shall provide a high-level network architecture diagram showing nodes and gateway locations with the technical proposal. The Contractor shall provide detailed network configuration documentation, and transmission plans (post award deliverables).
 - 3.2.3.7 The Contractor will be required to meet Federal and DoD Information Assurance requirements for a Moderate Impact Information System. The Contractor's information assurance boundary is where the Contractor's services connect to the user terminals/equipment, satellite(s) employed, and systems used in the Satellite Operations Centers (SOCs), Network Operations Centers (NOCs), and teleport.
- 3.2.4 Testing and Installation
- 3.2.4.1 The Contractor shall develop a testing and installation plan and schedule for the system and provide it to the Government for review/approval no later than 30 calendar days after award. The Contractor shall provide a completed test and installation report to the Government within fourteen (14) calendar days of installation completion. This is a post-award deliverable. See Section L.22.2 regarding submission of post-award contract deliverables.
 - 3.2.4.2 The Contractor will be provided with a sensor system and motion-activated surveillance camera for testing at the Contractor's facility prior to the shipment of equipment to South America. The Government understands that there may be some differences in the test configuration due to satellite coverage and teleport location limitations, but the test equipment configuration and network architecture should mirror the proposed network architecture as much as practical.
 - 3.2.4.3 The Contractor shall demonstrate Ethernet connection to the internet and verify link stability and data transfer (i.e. Availability and CIR). After link status has been verified the Contractor shall connect the GFE sensor and camera Ethernet connections to their equipment and verify operational testing.
 - 3.2.4.4 A subject matter expert (SME) from the EAA will be available to attend testing at the Contractor's facility. The SME will provide any assistance required to make configuration changes to the sensor and surveillance systems. Additionally, the SME will have the authority to validate the test results.



- 3.2.4.5 The Government will provide a SME from the EAA to accompany the Contractor's installer(s) at each of the remote locations based off of the proposed installation schedule. Up to two (2) SMEs are available if the Contractor proposes to perform installations simultaneously. The Government will make every attempt possible to synchronize the SME's travel arrangements with the Contractor's installer(s).
- 3.2.4.6 The Contractor shall ensure that all equipment installed at the remote locations is securely installed, shielded, grounded and labeled. The Contractor shall demonstrate Ethernet connection to the internet and verify link stability and data transfer (i.e. Availability and CIR). After link status has been verified the Contractor shall connect the GFE sensor and camera Ethernet connections to their equipment and verify operations at each site.
- 3.2.4.7 The SME from the EAA accompanying the Contractor's installer(s) will provide any assistance required to make configuration changes to the sensor and surveillance systems. Additionally, the SME will have the authority to validate the installation.

3.2.5 Lifecycle Management

- 3.2.5.1 The Contractor shall present an approach for lifecycle management (on-going maintenance and operational support services, customer care and help desk support to include electromagnetic interference (EMI)/radio frequency interference (RFI) resolution support). This shall include all hardware/software elements and ancillary items necessary for maintaining an operational availability of 99.5%. The Contractor shall discuss the approach to minimize mean time between failure and mean time to repair.
- 3.2.5.2 The Contractor shall use available commercial materials to the maximum extent possible.
- 3.2.5.3 The Contractor shall address warranty service, spare parts, and field support.
- 3.2.5.4 The Contractor shall provide OEM Documentation and Manuals for all Contractor Installed Equipment.
- 3.2.5.5 The Contractor shall identify long-lead item procurement risks, and provide mitigation.



- 3.2.5.6 The Contractor shall discuss maintenance support for all sites to include the replacement of defective components, upgrades to include commercial off-the-shelf (COTS) technology insertion, and any software updates, as required.
- 3.2.5.7 The Contractor shall plan for a complete tech refresh of all Contractor provided satellite communications terminal and ancillary equipment at all remote sites. The tech refresh shall be scheduled for the beginning of first option period (Year 6) as specified in Section 4.2. The Contractor should assume an annual rate of inflation of 2.5% of the proposed equipment price in Year 1.

3.2.6 Personnel Travel, Environmental, and Safety Hazards

The Contractor shall identify and assess personnel Travel, Environmental, and Safety Hazards for each of the remote sites for which contractor personnel are required to perform equipment installation.

3.2.7 EMI/RFI Identification and Resolution

The Contractor shall have a means of satellite communications EMI/RFI identification, characterization, and geo-location. The Contractor will be required to analyze and report all EMI/RFI to the Government and may be asked to participate in exercises involving EMI/RFI. The Contractor shall explain how EMI/RFI identification and resolution will be communicated to the Government.

3.2.8 Network Monitoring

- 3.2.8.1 The Contractor shall establish, and provide the U.S. Government access to a web portal to present the health of the entire solution in a consolidated view using data from multiple sources and provide alert notification via email for any change in network operational status. Access procedures for the web portal will be established after award.
- 3.2.8.2 The Contractor shall staff a 24/7/365 Network Operations Center (NOC) as a focal point for network access, technical support, and troubleshooting. NOC staff shall be English-speaking and U.S. citizens.



- 3.2.8.3 The Contractor shall provide status reporting on equipment status, network status, and network utilization. The Contractor shall create and manage trouble tickets. The Contractor shall produce monthly and annual resource utilization reports. These are post-award contract deliverables. See Section L.22.2 regarding submission of post-award contract deliverables.

3.2.9 Frequency Clearances and Approvals

- 3.2.9.1 The Contractor shall describe the frequency clearance requirements for each of the South American locations and explain how the requirements will be met to allow transmission in Host Nations. The Contractor shall support Host Nation Agreement (HNA) efforts in obtaining international approvals for radio spectrum operations under this contract in foreign nations. The Contractor shall ensure that international services provided under this contract may be provided as scheduled with the full approval of each affected host nation. Typical services may include, but are not limited to: HNA, landing rights, operating agreements, site licenses, and frequency clearances.
- 3.2.9.2 Frequency Clearances for all terminals shall be required prior to the start of managed network services.
- 3.2.9.3 Frequency Clearances shall be requested for the maximum time period allowed by the host nation, up to the life of the contract.
- 3.2.9.4 The Contractor shall provide the Government with copies of regulatory licenses and approvals obtained to operate and use the spectrum for countries within the required service region.

3.2.10 Additional Requirements

- 3.2.10.1 The Contractor shall provide all required software and firmware for all contractor furnished equipment. See Section L.22.2 regarding submission of post-award contract deliverables.
- 3.2.10.2 The Contractor will provide an unpriced Bill of Materials (BOM) in Microsoft Excel that will include services, equipment, and labor (See Attachment J-19 or J-20).

4.0 Performance

4.1 Locations



Work is to be performed at contractor facilities and at remote sites in South America. All equipment shall be shipped from the Contractor's facility to the remote sites in South America after successful completion of testing. All travel expenses, shipping costs, taxes, customs fees and tariffs will not be evaluated as part of the price proposal.

4.2 Period of Performance

The period of performance for this Task Order will be five (5) years. In addition to the CLINs priced by the Contractor during the 5-year period of performance (Years 1 through 5), the Contractor shall propose pricing for the two CS3 option periods: one (1) three-year option period (Years 6 through 8) followed by one (1) two-year option period (Years 9 and 10), and the FAR 52.217-8 six-month extension option.

In the first six months after contract award, the Contractor shall acquire, integrate, test, and deliver the requested capability.

5.0 Government Support

5.1 Government Furnished Equipment/Facilities:

- Power (110 VAC or 220 VAC) will be provided at two of the sites: Puerto Williams, Chile and Ventiocho de Novembre, Argentina).
- A complete sensor and motion-activated surveillance system will be provided for testing at the Contractor's facility. Upon successful completion of testing, all GFE will be returned to the Government. The GFE used for testing will be identical to the equipment at the remote locations.
- An approved remote site where the Contractor will install the self-contained environmental enclosure and terminal equipment.
- One sensor system has been installed at each of the six EAA site and has a standard Ethernet connection, the sensor system will require PoE: +5V / 250 mA or PoE IEEE 802.3af from the Contractor.
- One motion-activated surveillance camera system has been installed at each of the six EAA sites and has a standard Ethernet connection, they will require PoE: +5V / 250 mA or PoE IEEE 802.3af from the Contractor.

6.0 Security

The Contractor shall articulate processes and procedures to address the security requirements for personnel assigned to the task order. All Contractor personnel assigned to this task shall be US citizens and possess at least United States Moderate Background Investigation (MBI) public trust clearances.

The Contractor shall ensure that all controlled unclassified information is safeguarded in accordance with the guidance provided in DoDM 5200.1, Volume 4, Information Security Program: Controlled Unclassified Information (CUI).



7.0 Deliverables

7.1 Pre-Award Deliverables (Submitted with Contractor's Proposal)

The following deliverables will be used to document the comprehensiveness of the Contractor's complex satellite solution for the Environmental Data Network.

- FSS solutions require Link Budgets
- FSS solutions require maps with clearly depicted and labeled contour lines, demonstrating coverage across the required locations. Contour lines should clearly demonstrate satellite gain to noise temperature ratio (G/T), effective isotropic radiated power (EIRP),
- MSS solutions require coverage maps and contour lines.
- High-level Network Architecture diagram showing nodes and gateway locations
- Bill of Materials
- Original Equipment Manufacturer (OEM) Terminal/Equipment Technical Specifications (e.g. datasheets)
- Project Schedule (submitted in Adobe Portable Document Format (PDF))

7.2 Post-Award Deliverables

- Detailed Network Configuration Documentation, and Transmission Plans
- OEM Documentation and Manuals for all Contractor Installed Equipment.
- Test Plan
- Testing and installation completion reports
- HNA Frequency Clearances, Regulatory Licenses and Approvals
- Status Reports
- Detailed Network Configuration
- Transmission Plan (for FSS only)

8.0 Pricing

8.1 Instructions

Section B (Supplies or Services and Prices/Costs) and the STO #1 Excel Workbook (Attachment J-9) contain all pricing instructions.

(END OF SECTION J, ATTACHMENT J-10)